

time's work and a useful bibliography, see E. Portalié, *A Guide to the Thought of St. Augustine* (New York, 1960).

ERNAN McMULLIN

**AUSTEN, RALPH A. C.** See *Godwin-Austen, Ralph A. C.*

**AUSTIN, LOUIS WINSLOW** (*b.* Orwell, Vermont, 30 October 1867; *d.* Washington, D.C., 27 June 1932), *radio physics*.

Austin graduated from Middlebury College in Vermont in 1889 and received the doctorate from the University of Strasbourg in 1893. He served as a member of the physics faculty of the University of Wisconsin from 1893 to 1901, and then returned to Germany for research work at Charlottenburg. In 1904 he entered U.S. government service in the Bureau of Standards and began a series of researches on radio transmission that made him world famous. The scope of his research was considerably enhanced by the establishment of a naval radiotelegraphic laboratory at the Bureau of Standards in 1908. This arrangement continued until 1923, when the laboratory and two others were merged into the radio division of a new unit (at the Navy Department), the Naval Research Laboratory.

Austin was in charge throughout this period, and thus had many opportunities for long-range transmission experiments. The most important was a test made in 1910, when U.S. cruisers en route to and from Liberia maintained radio contact with America and helped Austin and his collaborator Louis Cohen (1876-1948) to establish the Austin-Cohen formula, a semiempirical method for predicting the strength of radio signals at remote locations. The formula remained in use for many years and played an important role in the design and manufacture of improved apparatus. (Prior to World War I, the U.S. Navy had so much difficulty in making American firms meet its specifications that it began to design and manufacture its own radio receivers.)

In 1923 Austin resumed his work for the Bureau of Standards proper and became head of its laboratory for special radio transmission research. He contributed significantly to the understanding of the sources of radio atmospheric disturbances ("static"), a field in which he remained fruitfully active until his death.

As the doyen of U.S. government radio scientists, Austin exerted considerable influence and leadership in the development of radio engineering. He was one of the first members of the Institute of Radio Engineers (he joined on 22 January 1913), and one of the

few with a doctorate; he served as IRE's third president in 1914 and in 1927 received its Medal of Honor. Just before his death, Austin was unanimously nominated for the presidency of the International Radio Scientific Union (URSI), of whose U.S. national committee he had served as president.

#### BIBLIOGRAPHY

A list of Austin's major publications appears in Poggen-dorff, *Biographisch-literarisches Handwörterbuch*, Vols. V and VI. An obituary by Lyman J. Briggs is in *Science*, **76** (1932), 137. For Austin's contributions to marine radio communications, see L. S. Howeth, *History of Communications-Electronics in the U.S. Navy* (Washington, D.C., 1963).

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